VELOCITY OF FALLING RAINDROPS.

In the American Meteorological Journal for September, 1887, 4:207, the late Prof. Henry Allen Hazen opposes the idea adopted by Prof. Joseph Henry and many others, that the gust blowing outward from a thunder-storm may be due to the air driven down by falling raindrops (in addition to the descent due to the density of the air cooled by the evaporation of the falling drops). The question of the velocity of the falling drop is therefore important in this connection, and has been newly considered by Dr. T. Okada,[1] of the Central Metorological Observatory, Tokyo, Japan.

Altho in nature we see a rapid series of changes going on by which large falling drops break up into small ones whose diameters are in the ratio 1:2:4:8, and altho we do not often observe the union of small drops into larger ones, yet Okada adopts the idea worked out mathematically in W. H. Besant's Treatise on Dynamics, 3d edition, 1902, p. 78, that the falling drop receives continually accessions proportional to its surface area; he also adopts $C = 0.204$ as the constant for the air resistance and deduces the following table of resulting velocities in meters per second.

TABLE 1.—*Velocities of falling raindrops.*

Distance fallen.	Diameters of drops.			
	1 mm.	2 mm.	3 mm.	4 mm.
Meters.	*M.p.s.*	*M.p.s.*	*M.p.s.*	*M.p.s.*
1,000	3.1	3.5	4.0	4.4
1,500	3.6	4.0	4.4	4.8
2,000	4.0	4.4	4.8	5.1
2,500	4.4	4.8	5.1	5.4
3,000	4.8	5.1	5.4	5.7

—*C. A.*

WIRELESS TELEGRAPHY IN THE SERVICE OF MODERN METEOROLOGY.

RESULTS OF INVESTIGATIONS MADE DURING A TRANSATLANTIC VOYAGE IN AUGUST, 1908.

By Dr. P. POLIS, Director of the Meteorological Observatory of Aachen (Aix-la-Chapelle). Dated Aachen, October 22, 1908.

[Translated by C. Fitzhugh Talman, Librarian, Weather Bureau.]

The first attempts to utilize wireless telegraphy for the benefit of the weather service were undertaken in 1904 by the London Daily Telegraph, and led to a discussion of the subject at the International Meteorological Conference at Innsbruck, 1905. The matter was brought before the Conference and a report on the subject presented by the writer of this article. The question was referred to the International Meteorological Committee.

Experiments in this line have likewise been carried on by the British Meteorological Office, under the direction of Doctor Shaw, with the use of observations taken on board British warships. The United States Weather Bureau, also, made use some years ago[1] of such reports from vessels on the Atlantic, to enlarge the scope of its weather maps.

Last year I paid a visit to the United States, in the course of which I made some preliminary investigations regarding the transmission of weather reports at sea. These investigations were continued on a larger scale in August of this year during a voyage to America and return on board the *Kaiserin Auguste Viktoria*, from the 7th to the 27th of August. Not only were weather telegrams sent from ship to ship, but wireless reports containing meteorological data were also received from land stations in Europe and America; the former viâ the Marconi station at Clifden, the latter viâ Cape Cod. All steamers passing within range of the *Kaiserin* were requested to communicate meteorological observations taken during the preceding twenty-four hours. These observations were secured thru an understanding most obligingly entered into by the other steamship companies with the Hamburg-American Line; and the telegrams were transmitted free of cost by the Marconi company. These telegrams contained the position of the ship, time, height of the barometer, temperature of air and water, and wind direction and force. Generally as many as five reports from vessels were available daily. Moreover observations from stations on the British and French coasts were forwarded daily from the observatory of Aachen, by way of the Marconi station at Clifden, for four days after the ship left Cherbourg, i. e., to a distance of about 3,000 kilometers (1,864 miles) from the British coast. The telegrams, tho in cipher, were transmitted to this distance with absolute accuracy. A copy of one of these telegrams, that of August 11, is given below, accompanied by the translation:

Compagnie de Télégraphie sans Fil.

11 August 1908. Marconistation *Kaiserin Auguste Viktoria.*

Aufgabestation: Aachen.

Aufgenommen 43° N. Br. 45° 37′ W. L. 1640 Meilen von Scilly entfernt.

An POLIS:

62613 263 63126 64526 70928
68930 69532

Translation.

Aachen, 762.6, 13°, WNW., 3; Stornoway, 763.1, WNW.; Malin Head, 764.5, WNW; Valencia, 770.9, NW.; Scilly, 768.9, NNW.; St. Mathieu, 769.5, N.

The Central Office of the United States Weather Bureau, at Washington, very obligingly furnished, at my request, observations at stations on the American coast for the last days of the outward journey and the first two days of the return journey, thru the Marconi station at Cape Cod.

The material received was brought together in the form of a weather map, (see Chart IX), and it was found possible to make a map every day on both the outward and the return journey. Thus on the weather map of August 11 (Chart IX, fig. 2), when wireless telegrams from Clifden were still being received at longitude 45° west, observations from the French and British coasts were charted, and there were also five observations from vessels. The map shows a high-pressure area extending from France to the Azores, a low near Iceland (see Chart IX, fig. 1), and a second low in the neighborhood of the Newfoundland Banks. The latter moved eastward and crost the track of the *Kaiserin* in the following night, bringing cloudiness, rain, and strong southwest winds. The weather map of August 22 (Chart IX, fig. 4), made on the homeward journey, extends from eastern America to 30° west longitude. It shows the state of the weather for a distance of 800 miles from the *Kaiserin*, as it was possible to utilize the observations of several west bound ships. This map shows a depression between 40° and 30° west longitude, in which the steamers *Kronprinzessin Cecilie* and *Germania* had stormy west winds. This depression moved eastward, while a high-pressure area accompanied the *Kaiserin* from the United States as far as the middle of the Atlantic Ocean.

[1] Journal of the Meteorological Society of Japan, August, 1907, p. 1.

[1] The Weather Bureau work in wireless telegraphy began in January, 1900, when R. A. Fessenden was employed to carry out the instructions of the Chief of the Bureau. The development of the Weather Bureau system was subsequently relinquished; but the receipt of daily wireless messages from ocean vessels for use in compiling weather maps and forecasts began December 3, 1905. (See Monthly Weather Review, 1906, 34: 609-10.) Before July 15, 1902, the Marconi station on Nantucket was transmitting, via Nantucket Shoals Lightship, the regular Weather Bureau daily forecasts to such Cunard Line steamers as requested it.

The current condition of our experience is summarized in the Annual Report of the Chief of Bureau, which will appear in our Annual Summary for 1908.—*C. A.*